

Notes on the Classification of Certain African Membracidae with the Addition of Three New Genera and Four New Species (Hemipt.—Homopt.)

by

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During the past few years it has become increasingly obvious that much confusion exists in the classification of many African Membracids. This has been largely occasioned by the fact that the older workers on the group provided such inadequate descriptions, and failed in most cases to figure the species, or figured them so badly as to be useless as an aid to their determination. It has been found to be almost impossible to correctly determine the majority of species from the meagre descriptions, and it was impossible for me to examine the types, so the only course open to me was to try to obtain photographs of them. The authorities of the British Museum undertook this work for me and the result has been very gratifying as the types of practically all the desired species have been photographed, and the results are so good that the correct generic position of a number of species which had been wrongly assigned, can be readily appreciated.

Apart from the photographs, personal study has revealed that all is not well from the point of view of classification and that many species do not conform to the given characters of the genera in which they have been placed by the early workers, and this has caused errors on the part of others later working in the same field.

In this paper I hope to clear up some of the more obvious errors, without, at this stage, attempting to arrange the genera in their natural groupings, which are still not fully understood.

TERMINOLOGY

The terminology used by past workers is for the most part satisfactory, but to avoid ambiguity, I consider that certain terms in use in regard to the head should be changed and their use clarified.

When the head is described as to shape, it is often said to be subquadrate, and it is obvious that the eyes cannot be included in such a term. What is really meant is that the vertex is subquadrate (Funkhouser, 1917), and it

seems to me desirable to speak of the shape of the vertex rather than the shape of the head. It also seems more correct to refer to the "base" as the upper margin of the vertex, and the "inferior margins of the genae" as the lower or inferior margins of the vertex.

The position of the ocelli is much used in classification and they are usually spoken of in relation to "a line drawn through the centres of the eyes". This is rather verbose and I propose to substitute "the centro-ocular line", and it is necessary to explain exactly what is meant by this, because in some species the eyes are ovate and oblique and in others they are globular. This centro-ocular line must therefore be taken as an imaginary line drawn through the middle of the inner margin of the eyes, *when the head is held in a vertical plane to the observer's eye.* (Fig. 1)

The width of the head is understood to mean the distance between the outer margins of the eyes; and the length, the greatest vertical distance between the upper and lower margins of the vertex.

The tegminal pterostigma is a thickened, usually opaque spot on the subcostal margin of the tegmen, or fore wing. It has been largely disregarded or un-noticed by past workers, although mentioned by Schmidt (1911), Pelaez (1935), and Funkhouser (1951). It is also mentioned by Evans (1948) who attaches some systematic importance to it. Funkhouser (1951) makes the rather amazing statement that "it is rare in the Membracidae". However far this may be true for the rest of the world, it is certainly not so as regards the African fauna, as it is present in all the species of no less than sixteen genera recorded from the African continent. It is present in the following genera: *Acanthophyes*, *Anchon*, *Barsumas*, *Evanchon*, *Hamma* (= *Amitrochates*), *Hybanda* (= *Beninia* = *Eumonocentrus*), *Leprechaunus*, *Monocentrus*, *Negus*, *Paraxiphopocus*, *Platybelus*, *Promitor*, *Spalirises*, *Takliwa*, *Tricoceps* and *Tshaka*. In most of these genera it is clear and well defined, but in *Negus* it amounts to little more than a thickening of the subcostal vein and there is some doubt if it can be regarded as a true pterostigma; in *Takliwa*, although large, it is colourless and barely noticeable.

On reviewing the genera in which this feature occurs, it would seem that they form a natural group, with the possible exception of *Negus* and *Takliwa*, and I consider that this group of genera should be separated from the CENTROTINAE to form another sub-family, for which I propose the name PLATYBELINAE.

That the early developmental stages offer important clues pointing to the natural relationships, there can be little doubt, but unfortunately, little has been done to figure or describe the nymphal forms, and this type of material seems to be little collected, or if captured has not been associated with definite adults, so that little is yet known about them.

Much work remains to be done before I can review all the African genera, but it is evident that several are synonyms, and many species have been assigned to the wrong genus, in which case it seems desirable to re-state the generic characters, beginning with the following genus:

Genus **Centrotus** Fabricius, 1803.

This old genus has been the clearing-house for many species, and no less than 281 species have been assigned to it up to the present time, of which only 42 now remain. Sixteen of them are African species, eleven of which I now propose to transfer to other genera, but before doing so the genus must be re-stated in the light of modern knowledge, based on the genotype *C. cornutus* Linnaeus 1746, as follows:

Moderately large to large robust insects with strong suprahumeral horns and a heavy posterior process which is expanded in the middle in a well developed inferior node.

Head more or less vertical, wider than long; vertex subquadrate, upper margin arcuate and a little sinuate, lower margins downwardly sloping and a little sinuate; eyes ovate and rather small; ocelli about as far from each other as from the eyes and situated a little above the centro-ocular line; clypeus longer than wide, broadly lobate at base and extending for more than half its length below the lower margins of the vertex.

Thorax. *Pronotum* convex; metopidium almost vertical and a little broader than high; suprahumeral horns strong and heavy; posterior process heavy, tectiform, more or less straight, arising a little above the scutellum, with a well developed inferior node about the middle which impinges on the tegmina, more or less acuminate to apex which extends as far as, or beyond the internal angles; tegmina broad, without pterostigma, with five apical and two subapical cells, tip rounded, apical limbus broad; hind wings with three apical cells; humeral angles large and blunt; mesopleura without processes (McAtee & Malloch, 1928); legs simple, femora cylindrical, tibiae triquerate and minutely spined.

Scutellum large, heavy, entirely exposed, a little longer than wide, tip deeply emarginate.

Of the nineteen African species which have been placed in this genus, eleven fail to meet the generic requirements and must be transferred to other genera as follows:—

bantuanus Distant (1908) and *shoanus* Distant (1916) to *Otinotus*. My own species *hobohmi* and *mossoi* (1951) to *Umfilianus*. *quadripunctatus* Stal (1855) and *spinicornis* Stal (1855) to *Tricocceps*; *flagellifer* Signoret (1858) and Pelaez' species *colladoi*, *globifer*, *nodulatus*, and *tenispina* (1935) to *Platybelus*.

The following species remain in *Centrotus*:—

bovinus Distant (1916), *difficilis* Dist. [= *Beaufortiana difficilis*, Dist. (1916)], *distanti* [= *Beaufortiana cornuta* Dist. (1916)], *laxatus* Dist. (1916), *marshalli* Dist. (1916), *pacificus* Gerstaecker (1873), *subdodosus* Jacobi (1912) and *varipennis* Signoret (1858).

Centrotobelus gen. nov.

Very close to *Centrotus* and falling between this genus and *Centrotusoides* Dist. (1916). Differing from *Centrotus* in having four apical cells in the hind wings, the ocelli situated on the centro-ocular line, the lobes of the clypeus rather narrower, and the rostrum reaching to the base of the abdomen. Differing from genus *Centrotusoides* in the rounded tip of the clypeus, the longer rostrum and the venation of the tegmina, which in *Centrotusoides* have five apical, three subapical and two sub-basal cells.

Head wider than long; vertex subquadrate, sculptured, upper margin arcuate with a swollen prominence above each ocellus, lower margins downwardly sloping and a little sinuate; eyes large, subovate; ocelli small, conspicuous, as far from or a little closer to each other than to the eyes and situated on the centro-ocular line; clypeus about twice as long as wide, somewhat narrowly lobate at base, extending below lower margins of vertex for about two-thirds its length; rostrum reaching to base of abdomen.

Thorax. *Pronotum* convex; metopidium a little sloping backwards, much wider than high; suprahumeral horns robust, extending outwards and upwards, lateral margins carinate; posterior process rising a little above the scutellum and a little arcuate over it, strongly inferiorly ampliate at middle and impinging on apex of scutellum, thence contiguous with the tegmina and acuminate to its tip which reaches just beyond the internal angles; tegmina about twice as long as broad, without pterostigma, with five apical and two subapical cells, tip rounded, apical limbus narrow; hind wings with four apical cells; humeral angles prominent, blunt; mesopleura with a distinct short process overlapping the mesonotum high up, just below the articulation of the tegmina, a second process low on the mesopleura upwardly directed towards the eye and engaging with the posterior margin of the mesonotum, not usually visible without dissection; legs simple, tibiae triquerate, posterior tibiae finely spinose, posterior tarsi longest.

Scutellum triangular, clearly exposed, wider than long, basal margin somewhat swollen, tip roundedly emarginate, apices acute.

Genotype ***Centrotobelus viridis*** sp.n. (Figs 15 to 19.)

A moderately large species, resembling *Centrotusoides muiri* Dist (1916) but with the tegminal venation of *Centrotus*. Ochraceous brown shading to pale green on the dorsal surface of the pronotum, the green colour being most noticeable in fresh specimens.

Female. *Head* wider than long, pale brownish ochraceous; vertex finely blackly punctate, very shortly palely pilose, upper margin arcuate and slightly sinuate with an undulate swelling above each ocellus, lower margins downwardly sloping and a little sinuate, this margin and a fascia extending inwards to the base of the clypeus, dark brown; eyes large, dark brown, sub-ovate;

ocelli amber coloured, small, conspicuous, closer to each other than to the eyes and situated about on the centro-ocular line; clypeus twice as long as broad, extending about two-thirds its length below the lower margins of the vertex, somewhat angularly lobate at base, slightly ampliate to tip which is rounded, rostrum reaching to second abdominal segment; antennae long, pale ochraceous. The head is sparsely covered with very pale cinnamon-coloured sericeous hairs which are thickest just above the lower margins of the vertex and on the clypeus.

Thorax. *Pronotum* brownish ochraceous, shading to very pale green at the bases of the suprahumeral horns, on the disc and along the posterior process, thickly blackly punctate on the suprahumeral horns with very short pale hairs, more or less thickly covered with very pale cinnamon-coloured sericeous hairs on the metopidium and more sparsely elsewhere; metopidium a little backwardly sloping, much wider than high, with irregular pale brown callosities above each eye; suprahumeral horns basally robust and a little swollen above humeral angles, tapering to their apices, extending outwards, upwards and a little forwards, tips slightly decurved and a little rounded, laterally carinate and very weakly carinate below; posterior process moderately slender at base, very slightly arcuate over scutellum, strongly ampliate at middle and impinging on apex of scutellum, thence contiguous with tegmina and acuminate to tip which reaches just beyond the inner angle of the tegmina, weakly tricarinate at tip, median carina green and strongly percurrent; tegmina subhyaline, veins ochraceous basally, sometimes tinged with green, apically the veins are darker, with five apical and two subapical cells, apical limbus very narrow; hind wings with four apical cells; lower part of notum, meso- and metapleura thickly sericeous with very pale cinnamon-coloured hairs; legs with basal joints dark brown and sericeous, tarsi and tibiae ochraceous; humeral angles prominent, ochraceous-brown and blunt.

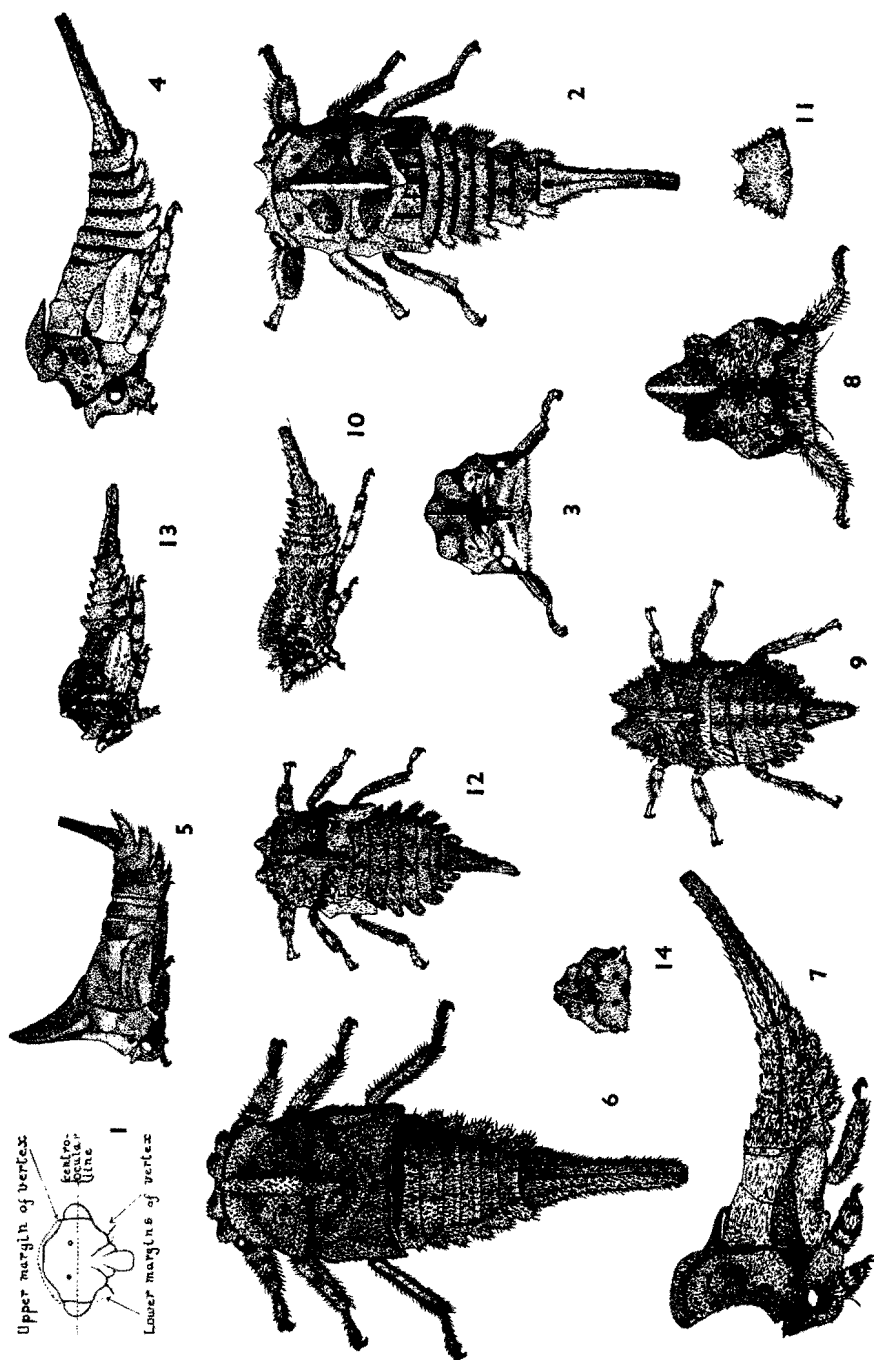
Scutellum pale ochraceous, basal margin brown and a little swollen, more or less sericeous with pale cinnamon-coloured hairs, more densely so at basal angles, tip roundedly emarginate, apices acute.

Abdomen long, extending well beyond apices of tegmina; above dark brown, finely punctate, lateral margins and posterior margins of tergites pale greenish ochraceous; genital segments basally black shading to chestnut brown at apex, more or less densely pilose.

Length 7.3 mm.; width across tips of suprahumeral horns 4.3 mm., at humeral angles 3.4 mm., at eyes 2.9 mm.

Male. Differing from the female in its shorter, more triangular shaped suprahumeral horns which are not at all forwardly directed, and in its rather brighter green colour on the dorsal surface. The abdomen does not quite reach the tips of the tegmina.

Length 6.3 mm.; width at tips of suprahumeral horns 3.75 mm., at humeral angles 3 mm., at eyes 2.7 mm.



Nymph, 3rd instar (?). Resembling in general form that of *Otinotus bantuantus* Dist., Figs. 2 to 4, but differing in the absence of tubercles on the thorax and abdomen. General colour dull ochraceous brown.

Head about four times as wide as long; vertex sub-crescent shaped, upper margin strongly arcuate with four weak tubercles, epicranial suture faintly visible, lower margin somewhat concave from frontal view, extended in a somewhat acute lobe below the eyes; eyes sordid ochraceous, globose; ocelli very small, obscure, about as far from each other as from the eyes and situated on the centro-ocular line; clypeus horizontal, scarcely visible from frontal view, marginally black; rostrum extending to second abdominal segment.

Thorax. *Pronotum* somewhat concavely backwardly sloping to the rather low crest which is a little declivous and extended in a short process over the metathorax; suprahumeral buds not very well developed; segmentation of meta- and mesothorax somewhat obscure; wing buds extending to second abdominal segment.

Abdomen with seven visible segments, segments three to seven bearing a pair of strong lamellae, the pair on segment two being more or less rudimentary; anal tube rather short, only about three times as long as the average lamella.

Host plant: *Lycium ferocissimum* Miers (*Solanaceae*).

Holotype ♀, allotype ♂, 15 ♀, 25 ♂ paratypes, 10 nymphs. All are from Port Elizabeth, C.P. Those collected by Mr. A. J. Duke and Mr. C. G. C. Dickson were taken on the host plant at Sea View, Port Elizabeth, on 10th October and 16th November, 1950, respectively, and the remainder were collected by Dr. Brauns about 1892, but these bear no date.

Holotype and allotype in my collection, paratypes in Transvaal Museum, Pretoria, South African Museum, Cape Town, National Museum of S. Rhodesia, Bulawayo, and the Naturhistorisches Museum, Vienna.

LEGEND TO FIGURES

1. Diagram of head (*Centrotus cornutus* L.).
2. *Otinotus bantuantus* Dist. nymph, dorsal view.
3. " " " " frontal view.
4. " " " " lateral view.
5. *Izzardiana arcuatus* Funkh. nymph, lateral view.
6. *Umfilianus hobohmi* Capnr. nymph, dorsal view.
7. " " " " lateral view.
8. " " " " frontal view.
9. *Dukeobelus simplex* Walk. nymph, dorsal view.
10. " " " " lateral view.
11. " " " " head.
12. *Dukeobelus dukei* sp.n. nymph, dorsal view.
13. " " " " lateral view.
14. " " " " frontal view.

Centrotobelus braunsi sp.n (Figs. 20 to 22.)

Near *viridis* but differing in the shape of the suprahumeral horns, the more inferiorly nodulate posterior process and its smaller size.

Female. Head wider than long; vertex subquadrate, castaneous brown, blackly punctate with a short white hair arising from each puncture, upper margin arcuate and not sinuate, lower margins downwardly sloping and a little sinuous; eyes lead coloured, basally ochraceous, a little oblique; ocelli amber coloured, conspicuous, about as far from each other as from the eyes and situated on the centro-ocular line; clypeus about twice as long as broad, roundedly lobate at base, tip very slightly ampliate and rounded; rostrum reaching to base of abdomen; antennae ochraceous; postgenae densely tomentose.

Thorax. Pronotum convex, brownish ochraceous, more or less blackly punctate with a short white hair arising from each puncture; metopidium a little backwardly sloping, several bare brown callosities above each eye; suprahumeral horns broad at base and tapering to apex, extending upwards, forwards and outwards, tip slightly decurved, lateral margins weakly carinate, weakly posteriorly centrally carinate below; posterior process somewhat narrow at base, a little arched over the scutellum, elongately ampliate in an inferior node impinging on the apex of the scutellum and contiguous with the tegmina, superiorly acuminate produced and a little decurved to the apex which reaches about half way along the margin of the fifth apical cell; tegmina subhyaline, about two and a half times as long as broad, base broadly ochraceously coriaceous and deeply punctate, veins brown, broad and clear, margined with sericeous white hairs, five apical and two subapical cells, apical limbus narrow, tip rounded; humeral angles ochraceous, prominent and blunt; sides of thorax densely whitely tomentose; legs ochraceous brown.

Scutellum broader than long, blackly punctate, basally sericeous and ochraceous-brown shading to pale ochraceous at tip, apex emarginate and upturned to form a cradle for the base of the node of the posterior process.

Abdomen castaneous brown; above densely blackly punctate, posterior margins of tergites paler; below more or less densely creamily sericeous.

Length 5.5 mm.; width at tips of suprahumeral angles 3.5 mm., at humeral angles 2.7 mm., at eyes 2.25 mm.

Male. Differing from the female in its smaller size, its darker colour, the shorter less upwardly and forwardly directed suprahumeral horns, and the slightly larger inferior node of the posterior process.

Length 5 mm.; width at tips of suprahumeral angles 2.9 mm., at humeral angles 2.3 mm., at eyes 2 mm.

Holotype ♀, allotype ♂, 1 ♀, 1 ♂ paratype. Collected by Dr. Brauns at Willowmore, C.P., about 1896 but undated.

Holotype and allotype in the Transvaal Museum collection, paratypes in my collection.

Recorded as the prey of the wasp *Gorytes aglaia* Handl. (Fig. 23), a specimen of which is pinned with the holotype. A damaged nymph, probably of this species, and one of a species of *Oxyrhachis* was also preserved by Dr. Brauns as the prey of this wasp.

Genus **Otinotus** Buckton, 1903.

I have not seen the type of this genus, *Otinotus ammon* Buckt. (1903), an Indian species, but it is evident that *Centrotus bantuantus* Dist., and *C. shoanus* Dist., are very close to it and to *Otinotus nigrorufus* Dist. (1916).

This genus is distinguished by its moderately slender straight or slightly sinuous posterior process which lies close to the scutellum and impinges on the tegmina, terminating a little or well beyond the inner angle.

The African species placed in this genus at present are: *arcuatus* Funkh. (1919), *curvidens* Dist. (1916), *griseus* Melich. (1905), *nigrorufus* Dist. (1916), *pilosus* Funkh. (1919), *recurvus* Dist. (1916), and *biformatus* Capnr. (1951).

Of these, only *curvidens* Dist., and *pilosus* Funkh., agree with the more important generic features, and to them must now be added *bantuantus* Dist., and *shoanus* Dist.

The species *recurvus* Dist. clearly belongs to *Leptocentrus* and must now be transferred to this genus. I have not seen *O. griseus* Melich., but I have a photograph of a specimen determined by Melichar himself as this species which is closely allied to *Platybelus macrocerus* Pelaez (1936), so it would seem that this species should now be transferred to *Platybelus* for the present, although these two species with *P. mutabilis* Capnr. (1951), and *P. tanganyensis* Buckt. (1903) differ entirely in the shape of the posterior process from the rest of the species in this genus, and I think it will be necessary later to erect a new genus to accommodate them.*

A new genus must be formed for *O. arcuatus* Funkh., and *O. biformatus* Capnr., and I propose the name *Izzardiana*, which I dedicate to Mr. R. J. Izzard of the British Museum in appreciation of his ever-ready help.

Izzardiana gen. nov.

This genus is near *Centrotus* but differs in several important features, notably in having three subapical cells in the tegmina, four apical cells in the hind wings, and the stout slightly ampliate posterior process which is contiguous with the scutellum and tegmina.

Head vertical, three times as wide as long; vertex subelliptical, upper margin arcuate, lower margins sloping and slightly convex; eyes large, prominent, somewhat ovate; ocelli much closer to each other than to the eyes and situated very slightly above the centro-ocular line; clypeus much longer than wide, basally somewhat rectangularly lobate, tip expanded and truncate; rostrum short, scarcely reaching to base of posterior coxae.

* Since the preparation of this manuscript, I have received a photograph and sketches of the genotype of *Platybelus*, *P. flavus* Signoret (1858). These show that the usual conception of *Platybelus* as having the posterior process highly arched above the scutellum is wrong. In the genotype the posterior process is contiguous with the scutellum and slightly sinuous as in *macrocerus* Pelaez, but the supra-humeral horns are more like those of *Anchon*. The venation of the tegmina is obscure and irregular, and there appear to be several spurious veins. It is clear that this genus must be revised as soon as sufficient material is received for study.

Thorax. Pronotum somewhat convex, bearing a pair of stout suprahumeral horns, usually shorter and less forwardly inclined in the males; metopidium almost vertical, wider than high; posterior process robust, a little arched above the scutellum but inferior margin contiguous with or only a little raised above the tegmina, slightly ampliate at middle, tapering to tip which is usually a little decurved and blunt or moderately sharp, tricarinate, median carina strongly percurrent; humeral angles prominent and blunt; tegmina about three times as long as wide, without pterostigma, with five apical and three subapical cells, apical limbus moderately broad; hind wings with four apical cells; legs simple, tibiae triquerate, posterior tibiae finely spinose; mesopleura with two processes, the upper blunt and very little prominent, the lower usually entirely concealed as it engages with the notum; humeral angles blunt.

The nymphs of this genus (Fig. 5), have the pronotum raised in an upright process somewhat like those of *Oxyrhachis*, but the apex is blunt and it is frontally a little centrally depressed. The anterior and intermediate tibiae are flattened and somewhat foliaceous, posterior pair a little foliaceous and triquerate. The lateral margins of the third to seventh abdominal segments are furnished with broad lamellae which are fringed with stiff bristles. These lamellae are of service to the nymph when clinging to a stem, and in the fifth instar they are about half as long as the anal tube.

Genotype **arcuatus** Funkh. (1919).

The only other species so far described is *biformatus* Capnr. (1951) which was placed in *Otinotus* because of its affinity with *arcuatus*, and must now be transferred to *Izzardiana*.

The species *hobohmi* Capnr. and *mossoi* Capnr. (1951) were placed in *Centrotus* because of their closeness to *bantuanus* Dist., but this species has now been shown to belong to the genus *Otinotus*. The males of *hobohmi* and *mossoi* are without suprahumeral horns and have rather more sinuate posterior processes and are easily separated from *Otinotus*, but no reliable feature has so far been found for distinguishing the females with certainty. The nymphs should also be taken into account here, and they differ from *Otinotus* in the last instar in having the dorsal crest much more strongly raised, and as the males are very close to *Umfilianus declivis* Dist. (1915), it seems that they should be placed in the genus *Umfilianus* Dist.

Genus **Umfilianus** Distant, 1915.

This genus was described from a single male specimen of the species *declivis* Dist., which differs from *hobohmi* and *mossoi* in the more strongly arched posterior process. The female is unknown, but it is to be expected that as in the case of these two species it differs from the males in the possession of suprahumeral horns. This genus is very close to *Otinotus* from which it differs in the more sinuate posterior process and the absence of suprahumeral horns in the males. The author restates the generic characters as follows :—

Head vertical, about three times as wide as long; vertex subquadrate, somewhat convex, upper margin slightly arcuate, lower margins a little downwardly sloping and slightly curved, rather more strongly curved in the males; eyes moderately large, prominent, globular; ocelli about as far from each other as from the eyes and situated about on the centro-ocular line; clypeus about twice as long as broad, narrowly, roundedly lobate at base, very slightly expanding towards the truncate tip.

Thorax. *Pronotum* convex and without suprahumeral horns in the males (as far as is yet known), but with strong well developed ones in the females; metopidium vertical or a little sloping backwards; suprahumeral horns (when present) strong and well developed, extending outwards and a little upwards, rather broad, somewhat dorso-laterally compressed, marginally carinate, tips rounded or subacute; posterior process moderately robust, broadest at base, raised well above the scutellum, a little more strongly raised in the males, sinuous, tricarinate, apical third acuminate, tip reaching almost or quite to the margin of the fourth apical cell of the tegmina, median carina percurrent; humeral angles subprominent and blunt; tegmina nearly three times as long as wide, without pterostigma, with five apical and three subapical cells, apical limbus moderately broad. (The photograph of the type ♂ of *U. declivis* Dist. clearly shows five apical cells and not four as stated by Distant). Hind wings with four apical cells; legs simple, posterior tibiae triquerate and finely spinose.

Scutellum wider than long, tip roundedly emarginate.

The nymphs of this genus (Figs. 6, 7 and 8) resemble those of *Otinotus bantuantus* Dist. but the dorsal crest is much higher and of a different shape. The anal tube is about six times as long as the average abdominal lamella in the nymphs of the last instar.

This genus as it now stands is composed of the following four species :—*declivis* Dist. (1915). Only the ♂ so far known.

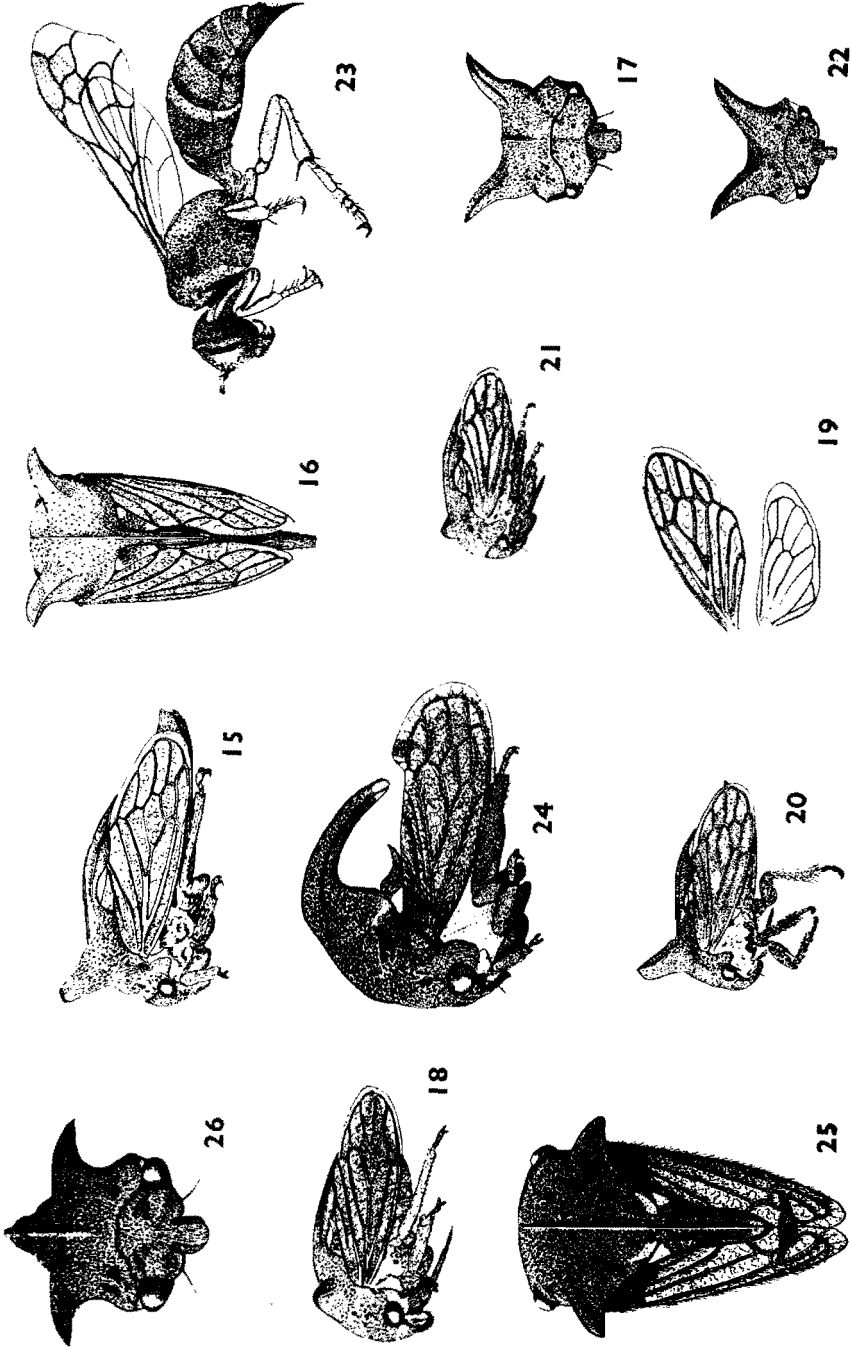
feneestratus Gerst. (1873). Funkhouser transferred this species from *Centrotus* to this genus (1951), but as I have not seen it or been able to obtain a photograph of it, I can make no comment.

hobohmi Capnr. (1951) and *mossopi* Capnr. (1951).

Goding (1930) erected a new genus *Planecornua* to accommodate the species *Centrotus infractus* Jacobi (1910), but it is clear that this species, together with *Xiphopocus hirculus* Jac. (1910) and *Centrotus quadripunctatus* Stal (1855) and *C. spinicornis* Stal (1855) should be placed in the following genus:—

Genus **Tricoceps** Buckton, 1903.

The genus *Planecornua* Goding (1930) should now be regarded as a synonym of *Tricoceps* (1903). The species *Tricoceps rugosa* Funkh. (1927b) is out of place here and it should be transferred to *Spaliriscus* Dist. (1916).



The genus as it now stands contains the following species, all from Africa:—

angulatus Pelaez (1935)

brunnipennis Germar (1835) Genotype

curvispina Distant (1916)

geniculatus Stal (1866). Stal placed this species in *Xiphopoeus* but the photograph of the type leaves no doubt as to its correct placing in this genus.

guineensis Pelaez (1935)

hirculus Jacobi (1910). This species was originally placed in *Xiphopoeus* where it was obviously out of place. In 1930 Goding erected the genus *Euxiphopocus* to accommodate this species and *X. geniculatus* Stal, and they were again wrongly placed in *Xiphopocus* by Funkhouser in 1951.

infractus Jacobi (1910)

quadripunctatus Stal (1855)

spicicornis Stal (1855)

To these can now be added the following new species:—

***Tricoceps singularis* sp.n.** (Figs. 24 to 26.)

A small species differing from all previously described species of this genus in the strongly rounded and deflexed posterior process which does not reach the internal angles of the tegmina. Small, black, shortly pilose with golden hairs, finely granulate and punctate, suprahumeral horns rather short and heavy, posterior process strongly arched from base and somewhat sharply declivous, tip rounded and reddish brown, not reaching the internal angles of the tegmina.

Male. Head a little more than twice as wide as long; vertex subquadrate, upper margin arcuate and feebly sinuate, lower margins downwardly sloping and convex; eyes dull greyish marbled with brown; ocelli large, prominent, pale amber, slightly closer to each other than to the eyes and situated above the centro-ocular line; clypeus almost as broad as long, longitudinally sulcate

LEGEND TO FIGURES

15. *Centrotobelus viridis* sp. n. lateral view ♀.
16. " " " dorsal view ♀.
17. " " " frontal view ♀.
18. " " " lateral view ♂.
19. " " " tegmen and wing.
20. *Centrotobelus braunsi* sp. n. lateral view ♀.
21. " " " " " ♂.
22. " " " frontal view ♀.
23. *Gorytes aglaia* Handl.
24. *Tricoceps singularis* sp. n. lateral view ♂.
25. " " " dorsal view ♂.
26. " " " frontal view ♂.

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on either side, extending for about two thirds its length below the lower margins of the vertex, tip blunt and very slightly upturned, rostrum reaching to base of posterior coxae; antennae ochraceous, flagellum rather long; postgenae black, lightly tomentose.

Thorax. *Pronotum* black, finely granulate and punctate, shortly goldenly pilose; metopidium high, frontally almost vertical then sloping backwards to base of posterior process, an irregular bare smooth callosity on either side above the eyes, a short white tomentose streak from the lateral angles of the scutellum to the bases of the suprahumeral horns; suprahumeral horns stout, rather short, about as long as the distance between their bases, slightly backwardly directed, from the front almost horizontal with the tips acute and slightly decurved, rather weakly tricarinate; posterior process very heavy at base, rising in a high curve from the disc of the pronotum and deflexed to the tip, which does not reach the inner angles of the tegmina, tricarinate, tectiform, tip reddish-brown and rounded; median carina becoming obsolete well above the cephalic margin; humeral angles blunt, rounded; sides of thorax densely whitely tomentose; tegmina about two and a half times as long as wide, somewhat wrinkled, apical third and a small area in the centre pale amber, remainder clear hyaline, veins yellowish and pilose, pterostigma small, black and coriaceous, base black and coriaceous with golden pilosity, a dark brown fascia from the internal angle to the base of the fourth apical cell, five apical and two subapical cells, apical limb moderately wide; hind wings with veins yellow, three apical cells and a wide limb; legs brown with golden pilosity, tarsi ochraceous, posterior tarsi longest.

Scutellum about as wide as long, tip shortly acutely emarginate and strongly upturned, finely granulate, punctate and shortly goldenly pilose, basal angles thickly tomentose.

Abdomen above grey, deeply sparsely punctate; below black and very shortly goldenly pilose.

Length 5.25 mm.; width across tips of suprahumeral horns 3.2 mm. Holotype ♂ beaten from a species of *Acacia*, which is probably the host plant, at Umgababa, Natal, 8 March, 1951 (A. L. Capener), in my collection.

The remaining species previously assigned to the genus *Centrotus*, i.e. *colladoi* Pelaez, *flagellifer* Signoret, *globifer* Pelaez, *nodulatus* Pelaez and *tenuispina* Pelaez, all possess tegminal pterostigma and agree with the generic characters of *Platybchus* where they should now be placed. (See footnote on page 109.)

Genus **Gongroneura** Jacobi, 1910.

Two species hitherto placed in the genus *Gongroneura* (= *Pedalion* Buckton, 1903), *ornata* Buckt (1903) and *triste* Buckton (1903) have a well developed and exposed scutellum and are closely allied to *Negus asper* Jacobi (1910), and should be placed in the genus *Negus*.

The binodose posterior process which is a characteristic feature of the genus *Gongroncura* is lacking in *brevicornis* Jacobi and *carinata* Funkh., and both these species should be transferred to the following genus.

Genus **Kombazana** Distant, 1908.

An examination of the type species *fidelis* Dist. (1908), shows that this genus is identical with *Xiphistoides* (= *Xiphidia* Goding, 1931), which now becomes a synonym of *Kombazana*. The species *gargaria* Dist., cited by Funkhouser (1927a, 1951) has no existence in fact, the citation by Funkhouser (1927a) (Distant, Ins. Trans. 217, 1908) being an error.

The genus as it now stands contains the following species, all from Africa:—

brevicornis Jacobi (1910), *carinata* Funkh. (1927), *fidelis* Distant (1908) genotype.

And *inermis* Jacobi (1910).

Genus **Uroxiphus** Amyot and Serville, 1843.

Two species have been included in this genus, *maculiscutum* Am. et Serv. (1843) (Figs. 27 to 29), and *simplex* Walker (1858). The latter species presents a number of features which are clearly different from the generic characters of *Uroxiphus*. It therefore appears desirable to restate the characters of this genus and to erect a new one to accommodate *simplex* and one other new species. The generic characters of *Uroxiphus* are therefore as follows:—

Head three times as wide as long; vertex subelliptical, upper margin arcuate, lower margins horizontal and convex; eyes large, prominent and ovate; ocelli large, about as far from each other as from the eyes and situated above the centro-ocular line; clypeus at least twice as long as wide, rather longly lobate at base, tip truncate, rostrum reaching to base of posterior coxae.

Thorax. *Pronotum* low, convex and without suprahumeral horns; metopidium sloping strongly backwards, wider than high; posterior process straight, tricarinate, very slightly ampliate below, acuminate to tip, almost contiguous with scutellum and impinging on tegmina, tip reaching well beyond the inner angles of the tegmina; humeral angles subacute; tegmina three times as long as wide, without pterostigma, veins more or less parallel, five apical and two subapical cells; hind wings with four apical cells; legs simple, posterior tibiae finely spinose, apex of posterior femora armed with a short blunt spine below, posterior tarsi longest.

Scutellum large, about as long as wide, upwardly directed, deeply roundedly emarginate, impunctate on lateral margins.

This genus is represented at present only by *maculiscutum*, which is distinguished from all other known African Membracids by its bright yellow scutellum.

Dukeobelus gen. nov.

Moderately large to large insects, with or without suprahumeral horns, posterior process heaviest in middle where it is somewhat elongately ampliate, reaching well beyond the inner tegminal angles. This genus is very close to *Tiberianus* Dist. 1915, but differs in the position of the ocelli which are about on the centro-ocular line (they are situated somewhat higher in *Tiberianus*), in the presence of strong nodulate swellings above each ocellus, and the much longer rostrum which extends well beyond the bases of the posterior coxae. Differing from *Uroxiphus* in the narrower and longer head, the swollen nodes above the ocelli, the less ovate eyes, the rounded lobes of the clypeus, the much longer rostrum, the narrower base of the posterior process which rises higher above the scutellum, the rather shorter opaque tegmina with their more divergent and somewhat curved veins, and the smaller and less prominent scutellum.

Head about twice as wide as long; vertex subquadrate, strongly sculptured, upper margin strongly arcuate with a strong prominent swelling over each ocellus, lower margins strongly downwardly sloping and sinuate; eyes moderately large, subovate; ocelli about as far from the eyes as from each other and situated on the centro-ocular line; clypeus longer than broad, broadly roundedly lobate at base with the inner margins of the lobes scarcely sulcate, tip truncate and a little rounded, rostrum very long, extending well beyond the posterior coxae.

Thorax. *Pronotum* convex, marginate along cephalic margin; metopidium sloping backwards; with or without suprahumeral horns; posterior process somewhat slender at base, a little sinuate and raised above the scutellum, somewhat longly ampliate in middle, tip decurved and reaching a little beyond the inner tegminal margin; humeral angles subprominent, blunt; tegmina about two and a half times as long as wide, more or less opaque, veins somewhat divergent and a little curved, five apical and two subapical cells; hind wings with four apical cells; legs simple, apex of posterior femora with a strong blunt spine below, posterior tarsi longest.

Scutellum wider than long, basally raised, apex acutely emarginate and depressed.

Genotype **simplex** Walker, 1858. (Figs. 30 to 33.)

Moderately large dark ferruginous in the females, dark piceous brown in the males.

Female. *Head* black, deeply punctate, with a short white hair arising from each puncture, strongly sculptured, other features as in generic diagnosis.

Thorax. *Pronotum* dark ferruginous-brown, deeply punctate, punctures bearing hairs as on head, cephalic margin strongly marginate; metopidium convex, backwardly sloping, without suprahumeral horns; posterior process

as in generic description; tegmina dark ferruginous, opaque except at apex which is a little translucent, finely punctate along margins of veins; sides of thorax somewhat sparsely tomentose; legs with the basal joints black, tarsi and tibiae ferruginous.

Scutellum wider than long, punctate with short white hairs, basally a little tomentose.

Abdomen above brown, deeply punctate, posterior margins of tergites narrowly ochraceous, apical segment black, punctate and shortly pilose; below blackish, finely punctate, posterior margins of segments broadly ochraceous, sparsely ochraceously pilose, genital segments shining chestnut brown, punctate and ochraceously pilose.

Length 8 mm.; width across humeral angles 3.4 mm.

The *male* differs from the female in its general piceous brown colour and the less decurved tip of the posterior process. Length 7.5 mm.; width across humeral angles 3 mm.

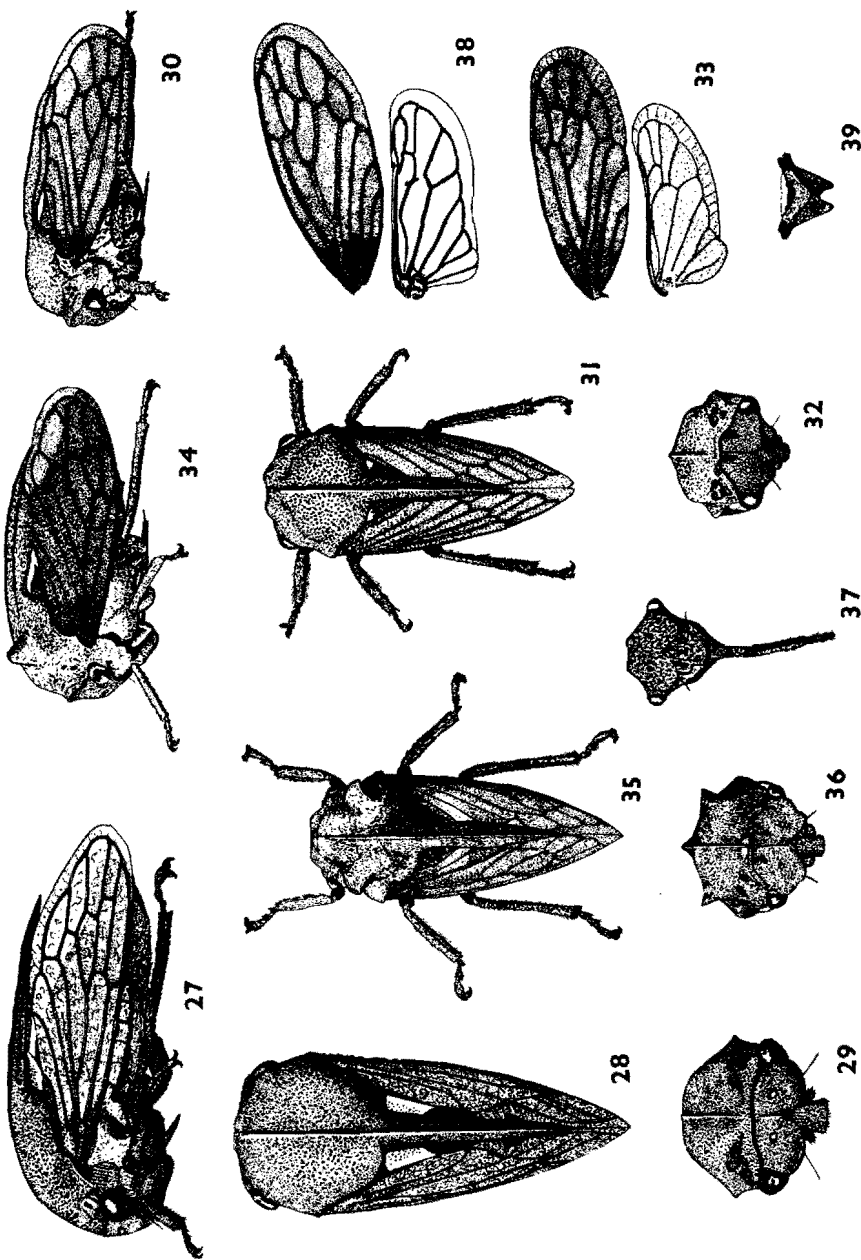
The nymphs of this species closely resemble those of *Otinotus bantuantus* Dist.

Nymph, 4th instar. (Figs. 9 to 11.) Densely, longly pilose and strongly tuberculate. *Head* wider than long, declivous; vertex dark brown, tuberculate, longly greyishly pilose, upper margin with a pair of strong tubercles covered with tuberculate hairs, sloping steeply from outer margins of tubercles to eyes, lower margins subhorizontal and slightly convex, produced into a lateral tubercle below the eyes; eyes globular, subprominent, creamy to brownish; ocelli small, inconspicuous, about as far from each other as from the eyes and situated slightly above the centro-ocular line; clypeus slightly convex and obscure, rostrum very long, reaching almost to base of anal tube. *Thorax* dark brown, thickly tuberculate, longly, greyishly pilose, segmentation obscure; metopidium strongly receding with a pair of tubercles above those of the head; dorsal crest low, not clearly separated from the meso- and metathorax, wing pads obscure and pilose; legs sordid ochraceous, tibiae banded with dark brown, a little compressed and longly pilose.

Abdomen above with seven visible segments and a row of strong pilose tubercles on either side of the median line and a row of weaker ones between these and the lateral lamellae; the second visible abdominal segment bears a pair of weak lateral lamellae, those on segments three to seven being strong, backwardly curved and marginally tuberculately pilose; anal tube about six times as long as the average lamella.

Host plant: *Protea grandiflora* Thunb. and other undetermined species of *Protea*.

Localities: Franschhoek, C.P. Jan.-Feb. 1948, '49, '50; Cape Town, Dec. 1948; Piquetberg Mountain, Dec., 1949, and Klein Drakenstein Mountains, Dec., 1949, A. J. Duke.



Dukeobelus dukei sp.n. (Figs. 34 to 39.)

Resembling *D. simplex* (Walk.) but differing chiefly in the presence of very short suprahumeral horns and its larger size.

Female. *Head* twice as wide as long; vertex dark chocolate brown, finely punctate and sculptured, sparsely sordidly sericeous, upper margin strongly arcuate and slightly sinuous with an undulate swelling above each ocellus, lower margins strongly downwardly sloping and weakly sinuous, weakly vertically carinate along epicranial suture; eyes moderately large and subovate, greyish, prominent; ocelli large, amber coloured, about as far from each other as from the eyes and situated on the centro-ocular line; clypeus longer than wide, broadly roundedly lobate at base, extending for two-thirds its length below lower margins of the vertex, tip truncate and rounded; rostrum extending to third abdominal segment.

Thorax. *Pronotum* dark chocolate brown, finely punctate, shortly sordidly sericeous from bases of punctures; metopidium convex, backwardly sloping; suprahumeral horns very short, varying in size and a little in shape but usually not extending outwards beyond the humeral angles, extending very slightly upwards, curving slightly backwards, tips subacute, carinate along lateral margins and very weakly so below; posterior process robust, almost straight, tricarinate, base rising a little above scutellum, ampliate at middle third and sometimes resting on the apex of the scutellum, then suddenly acuminate to tip which reaches to just beyond the inner angles of the tegmina; humeral angles prominent and blunt; tegmina about two and a half times as long as wide, dark chocolate brown, opaque except at tips which are subopaque, a small pale area at inner angle, veins thick and well defined; legs simple, dark chocolate brown; sides of thorax sericeous.

Scutellum wider than long, apex emarginate and upturned, finely punctate and sericeous.

Abdomen dark brown, finely punctate above, shortly pilose below, fifth sternite deeply emarginate almost to its base exposing base of saw sheath. *Length* 8.75 to 9 mm.; *width* across suprahumeral horns 3.0 to 4.0 mm., *width* across humeral angles 3.9 to 4.1 mm.

LEGEND TO FIGURES

- | | | | |
|-----|-------------------------------|--------------------|------------------|
| 27. | <i>Uroxiphus maculiscutum</i> | Amyot et Serville, | lateral view ♀. |
| 28. | " | " | dorsal view ♀. |
| 29. | " | " | frontal view ♀. |
| 30. | <i>Dukeobelus simplex</i> | Walk. | lateral view. |
| 31. | " | " | dorsal view. |
| 32. | " | " | frontal view. |
| 33. | " | " | tegmen and wing. |
| 34. | <i>Dukeobelus dukei</i> | sp. n. | lateral view ♀. |
| 35. | " | " | dorsal view ♀. |
| 36. | " | " | frontal view ♀. |
| 37. | " | " | head. |
| 38. | " | " | tegmen and wing. |
| 39. | " | " | scutellum. |

The *male* is so far unknown; it is probable that the suprahumeral are reduced in size or absent.

Nymph, 5th instar. (Figs. 12 to 14.) Very similar to that of *simplex*, more or less unicolorous brown, covered with short bristle-like recumbent hairs.

Head wider than long, brown, declivous; vertex thickly covered with short bristle-like hairs, upper margin strongly arcuate and sinuous with a strong tubercle above each ocellus and a weaker one between this and the eye; lower margins subhorizontal, a little sinuous and produced in a tubercle below each eye; eyes lead-grey, subovate; ocelli set in a deep wide depression on the centro-ocular line and about as far from each other as from the eyes; clypeus rounded from frontal view and obscure, rostrum reaching to fourth abdominal segment.

Thorax brown, covered with short recumbent bristle-like hairs, roughly sculptured; metopidium backwardly sloping, with a central pair of tubercles just above the cephalic margin, another pair of less pronounced ones at the frontal end of the dorsal crest, and laterally of this a large one above the bare callosity which is about in line with the minor cephalic tubercle; dorsal crest low, apex blunt and reaching nearly to posterior margin of metathorax; bases of wing pads strongly sculptured; mesothorax with a strong tubercle on each side of the dorsal crest; metathorax with a strong pair of medial tubercles, flanked on each side by another which is situated just above the wing pads; legs simple, ochraceous brown.

Abdomen with six visible segments, each with a strong pair of median and lateral tubercles; lateral lamellae of first segment rather small, those of the second segment somewhat larger and the remaining ones well developed; anal tube about four times as long as the longest lamella.

Host Plant: *Protca grandiflora* Thunb.

Holotype ♀, 24 ♀ paratypes and 17 nymphs collected by Mr. A. J. Duke in the following localities: Llandudno, C.P., Feb. 22nd, 1948, and Roode Zands Mountain, C.P., Jan. 15th, 1949.

Holotype and some paratypes in my collection, also some paratypes in the British Museum, Transvaal Museum, South African Museum and National Museum of Southern Rhodesia.

I am indebted to Dr. G. Arnold of the National Museum of Southern Rhodesia, Bulawayo, for kindly determining the ants attendant on this species as *Anoplolepis steingroveri* For.

I have much pleasure in dedicating this genus and species to Mr. A. J. Duke, of Cape Town, to whom I am so greatly indebted for so much valuable membracid material from the Cape Province.

ACKNOWLEDGMENTS

I should like to record my thanks to Mr. R. J. Izzard of the British Museum, for his ever-ready help and encouragement in many ways, without which this paper could not have been completed. Also to Mr. A. J. Duke, of Cape Town, who has painstakingly collected membracids for me for several years, and furnished me with much valuable material. Finally, I should like to express my thanks to Mr. H. Jover, of the Institut Intercolonial d'Adiopodoumé, Abidjan, for the specimen (amongst others) of *Uroxiphus maculiscutum* Am. et Serv. from which the drawings of this species were prepared.

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